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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Paper No. 04212004

Application Number: 09/931,763
Filing Date: August 20, 2001
Appellant(s): NAKAMURA ET AL.

MAILED

APR 28 2004

GROUP 1700

Robert Green
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 2/18/04.

(1) Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) Status of Claims

The statement of the status of the claims contained in the brief is correct.

(4) Status of Amendments After Final

No amendment after final has been filed.

(5) Summary of Invention

The summary of invention contained in the brief is correct.

(6) Issues

The appellant's statement of the issues in the brief is substantially correct. The changes are as follows: Applicant refers to U.S. Patent 4,311,660 to Burnam et al. however U.S. Patent 4,311,660 is to Barham et al. Additionally, regarding applicants issue 1, the 35 U.S.C. 103(a) rejection over Gash (U.S. Patent 4,355,076) is withdrawn.

(7) Grouping of Claims

The appellant's statement in the brief that certain claims do not stand or fall together is not agreed with because the 35 U.S.C. 103(a) rejection over Gash (U.S. Patent 4,355,076) is withdrawn such that there is no longer a Group (2). Thus, applicants Group (3) is renumbered Group (2) and applicants Group (4) is renumbered Group (3).

Group 1: Claim 13 (stands or falls alone with respect to the 35 U.S.C. 102(b) rejection)

Group 2: Claims 14-25

Group 3: Claim 26

(8) Claims Appealed

The copy of the appealed claims contained in the Appendix to the brief is correct.

(9) Prior Art of Record

(A) Listing of Prior Art of Record

4,355,076	GASH	10-1982
4,717,624	IKENAGA et al.	1-1988
4,313,660	BARHAM et al.	1-1982
3,361,607	BRUNO	1-1968

The Admitted Prior Art (Specification page 7, lines 17-23)

(B) Brief Description of the Prior Art of Record

Gash discloses a method for dry laminating at least two plastic films of same or different nature (i.e. each film may be oriented or unoriented and the films may have different melting points) wherein the method comprises contacting the films and heat pressing the films up to the melting temperature of the film having the lowest melting point to bond the films and form a low

peel strength composite. Gash teaches the plastic films may comprise oriented polyolefins including high density polyethylene.

Ikenaga et al. disclose bonded composites (e.g. including polyolefin containing) comprising a plurality of stacked sheets. Ikenaga et al. teach the stacked and bonded sheets comprise alternating oriented sheets having minus values for the average coefficient of linear expansion (LEC) next to oriented or unoriented sheets having plus values for the average LEC wherein the alternating arrangement of plus and minus values for the average LEC give the bonded composites improved dimensional stability.

Barham et al. disclose heat-treating oriented polyolefin films to give the films improved dimensional stability. Barham et al. teach the polyolefin films pass through a heat-treatment station, for example heated rollers, wherein the surfaces of the films are heated up to a temperature exceeding the normal crystalline melting temperature of the polyolefin followed by immediate cooling.

Bruno discloses bonding oriented polyolefin films that have been subjected to a heat-treatment. Bruno teaches the polyolefin films are oriented within a temperature range of 95-115°C. However, Bruno further teaches that the amount of orientation, i.e. stretch, and temperature at which the orientation is carried out are interrelated.

The admitted prior art discloses "An average linear expansion coefficient of polyolefin in an unoriented state is generally greater than $5x10^{-5}$ (/°C) in the 20-80 °C range. Due to the inclusion of the oriented polyolefin material, the polyolefin article of the present invention exhibits a value of not exceeding $5x10^{-5}$ (/°C) for average coefficient of linear expansion in the in the 20-80 °C range, as specified above. In other words, the oriented polyolefin material is

included in the polyolefin article so that its average coefficient of linear expansion in the 20-80 °C range is maintained at a value of not exceeding $5x10^{-5}$ (/°C)"

(10) Grounds of Rejection

It is noted the 35 U.S.C. 103(a) rejection over Gash (U.S. Patent 4,355,076) is withdrawn.

The following ground(s) of rejection are applicable to the appealed claims:

Claim 13 is rejected under 35 U.S.C. 102(b) as being anticipated by Gash (U.S. Patent 4,355,076) as evidenced by the admitted prior art (Specification page 7, lines 17-23).

It is noted the admitted prior art is used only as evidence of an inherent property of the materials taught by Gash such that its inclusion in the 35 U.S.C. 102(b) rejection is proper (See MPEP 2112).

Gash discloses a method for dry laminating at least two plastic films of same or different nature (i.e. each film may be oriented or unoriented and the films may have different melting points) wherein the method comprises contacting the films and heat pressing the films up to the melting temperature of the film having the lowest melting point to bond the films and form a low peel strength composite. Gash teaches the plastic films may comprise oriented polyolefins including high-density polyethylene (Column 1, lines 6-16 and Column 2, lines 25-27, 39-41, 46-50, and 55-68 and Column 3, lines 1-12). Gash does not specifically disclose that the oriented polyolefin films have an average coefficient of linear expansion (LEC) not exceeding $5x10^{-5}$ (/°C) in the 20-80 °C temperature range. However, it is noted the oriented polyolefin materials employed in Gash, particularly oriented high-density polyethylene, are the same as those claimed by applicant, and they are consistent and in agreement with applicants specification including applicants preferred materials (Page 9, lines 7-11) such that it appears an

average LEC not exceeding $5x10^{-5}$ (/°C) in the 20-80 °C is inherent to the oriented polyolefin materials taught by Gash. Furthermore, the admitted prior art (Applicants specification page 7, lines 13-23) discloses "An average linear expansion coefficient of polyolefin in an unoriented state is generally greater than $5x10^{-5}$ (/°C) in the 20-80 °C range. Due to the inclusion of the oriented polyolefin material, the polyolefin article of the present invention exhibits a value of not exceeding $5x10^{-5}$ (/°C) for average coefficient of linear expansion in the in the 20-80 °C range, as specified above. In other words, the oriented polyolefin material is included in the polyolefin article so that its average coefficient of linear expansion in the 20-80 °C range is maintained at a value of not exceeding $5x10^{-5}$ (/°C)" (Emphasis added). Thus, in view of the admitted prior art it appears it is unoriented polyolefin materials that have average LEC values greater than $5x10^{-5}$ (/°C) in the 20-80 °C range while oriented polyolefin materials exhibit average LEC values not exceeding $5x10^{-5}$ (/°C) such that the admitted prior art is evidence that the claimed LEC values are inherent to the oriented polyolefin materials taught by Gash.

Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gash and the admitted prior art as applied to claim 13 above, and further in view of Ikenaga et al. (U.S. Patent 4,717,624).

Gash and the admitted prior art as applied above teach all of the limitations in claim 14 except for a teaching on using as the oriented polyolefin sheets one having a minus average coefficient of linear expansion (LEC) and one having a plus average LEC. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use as the oriented polyolefin sheets taught by Gash as modified by the admitted prior art oriented sheets

having alternating plus and minus average LEC values to form laminated composites with improved dimensional stability as suggested by Ikenaga et al.

Ikenaga et al. disclose bonded composites (e.g. including polyolefin containing) comprising a plurality of stacked sheets. Ikenaga et al. teach the stacked and bonded sheets comprise alternating oriented sheets having minus values for the average coefficient of linear expansion (LEC) next to oriented or unoriented sheets having plus values for the average LEC wherein the alternating arrangement of plus and minus values for the average LEC give the bonded composites improved dimensional stability (Column 1, lines 20-29 and 43-68 and Column 2, lines 12-26 and 30-43 and Column 11, lines 38-30 and Column 12, lines 41-53).

Claims 15, 16, 19, 21, 22 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gash and the admitted prior art as applied to claim 13 above, and further in view of Barham et al. (U.S. Patent 4,311,660).

Gash and the admitted prior art as applied above teach all of the limitations in claims 15, 16, 19, 21, 22, and 26 except for a teaching on heat-treating the oriented polyolefin films. It would have been obvious to one of ordinary skill in the art at the time the invention was made to heat-treat the oriented polyolefin films taught by Gash as modified by the admitted prior art after they are oriented as was well known in the art to provide the films with increased dimensional stability as shown for example by Barham et al.

Barham et al. disclose heat-treating oriented polyolefin films after they are oriented to give the films improved dimensional stability. Barham et al. teach the polyolefin films pass through a heat-treatment station, for example heated rollers, wherein the surfaces of the films are heated up to a temperature exceeding the normal crystalline melting temperature of the

polyolefin followed by immediate cooling. (Column 1, lines 15-21 and Column 3, lines 58-68 and Column 5, lines 33-37 and 49-54).

Regarding claim 16, one of ordinary skill in the art at the time the invention was made would readily expect the oriented polyolefin films taught by Gash as modified by the admitted prior art and Barham et al. to have the same melting point ranges following the heat-treatment as those currently claimed as the oriented polyolefin films taught by Gash as modified by the admitted prior art and Barham et al. are the same as those claimed by applicant, they are consistent and in agreement with applicants specification, and the oriented polyolefin films undergo the same heat treatment as that taught by applicant.

Claims 17, 18, 20, 23, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gash, the admitted prior art, and Ikenaga et al. as applied to claim 14 above, and further in view of Barham et al. (U.S. Patent 4,311,660).

Gash, the admitted prior art, and Ikenaga et al. as applied above teach all of the limitations in claims 17, 18, 20, 23, and 24 except for a teaching on heat-treating the oriented polyolefin films. It would have been obvious to one of ordinary skill in the art at the time the invention was made to heat-treat the oriented polyolefin films taught by Gash as modified by the admitted prior art and Ikenaga et al. after they are oriented as was well known in the art to provide the films with increased dimensional stability as shown for example by Barham et al. (Barham et al. is described above).

Regarding claim 18, one of ordinary skill in the art at the time the invention was made would readily expect the oriented polyolefin films taught by Gash as modified by the admitted prior art, Ikenaga et al., and Barham et al. to have the same melting point ranges following the

heat-treatment as those currently claimed as the oriented polyolefin films taught by Gash as modified by the admitted prior art, Ikenaga et al., and Barham et al. are the same as those claimed by applicant, they are consistent and in agreement with applicants specification, and the oriented polyolefin films undergo the same heat treatment as that taught by applicant.

Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gash and the admitted prior art as applied to claim 13 above, and further in view of Bruno (U.S. Patent 3,361,607).

Gash and the admitted prior art as applied above teach all of the limitations in claim 25 except for a teaching on the temperature at which the polyolefin films are oriented. However, it is well known in the art that the orientation temperature is a function of the amount of orientation desired, as shown for example by Bruno, such that it would have been well within the ordinary skill of one in the art at the time the invention was made to experimentally determine/optimize the required orientation temperature depending upon the amount of orientation desired as doing so would require nothing more than ordinary skill and routine experimentation. Furthermore, it is well known in the art to orient polyolefin materials over the claimed temperature range as shown for example by Bruno such that it would have been obvious to one of ordinary skill in the art at the time the invention was made to orient the polyolefin materials taught by Gash as modified by the admitted prior art within a temperature range of 95-115 °C as only the expected results would be achieved.

Bruno discloses bonding oriented polyolefin films that have been subjected to a heat-treatment. Bruno teaches the polyolefin films are oriented within a temperature range of 95-

115°C. However, Bruno further teaches that the amount of orientation, i.e. stretch, and temperature at which the orientation is carried out are interrelated. (Column 3, lines 62-70).

(11) Response to Argument

Group 1: Claim 13 (stands or falls alone with respect to the 35 U.S.C. 102(b) rejection because the 35 U.S.C. 103(a) rejection over Gash (U.S. Patent 4,355,076) is withdrawn)

Claim 13

> Applicant argues, "The examiner has applied more than one reference in a 102 rejection;".

It is noted the admitted prior art is used only as evidence of an inherent property of the materials taught by Gash such that its inclusion in the 35 U.S.C. 102(b) rejection is proper (See MPEP 2112).

> Applicant further argues, "While the present application does state that the average coefficient of linear expansion of polyolefin in an unoriented state is generally greater than $5x10^{-5}$ (/°C) in the 20-80 °C range, it does not necessarily follow that all oriented polyolefin materials have a value lower than $5x10^{-5}$ (/°C) in the 20-80 °C range. This can be seen, for example, in comparative examples 4-12 of U.S. Patent No. 4,717,624 ("Ikenaga et al."), wherein each of the oriented layers possess average coefficients of linear expansion exceeding $5x10^{-5}$ (/°C) *(See col. 17-18)*".

As noted above the oriented polyolefin materials employed in Gash, particularly oriented high-density polyethylene, are the same as those claimed by applicant, and they are consistent and in agreement with applicants specification including applicants preferred materials (Page 9, lines 7-11) such that it appears an average LEC not exceeding $5x10^{-5}$ (/°C) in the 20-80 °C is inherent to the oriented polyolefin materials taught by Gash. Furthermore, the admitted prior art (Applicants specification page 7, lines 13-23) discloses "An average linear expansion coefficient of polyolefin in an unoriented state is generally greater than $5x10^{-5}$ (/°C) in the 20-80 °C range. Due to the inclusion of the oriented polyolefin material, the polyolefin article of the present

invention exhibits a value of not exceeding $5x10^{-5}$ (/°C) for average coefficient of linear expansion in the in the 20-80 °C range, as specified above. In other words, the oriented polyolefin material is included in the polyolefin article so that its average coefficient of linear expansion in the 20-80 °C range is maintained at a value of not exceeding $5x10^{-5}$ (/°C)" (Emphasis added). Thus, in view of the admitted prior art it appears it is unoriented polyolefin materials that have average LEC values greater than $5x10^{-5}$ (/°C) in the 20-80 °C range while oriented polyolefin materials exhibit average LEC values not exceeding $5x10^{-5}$ (/°C) such that the admitted prior art is evidence that the claimed LEC values are inherent to the oriented polyolefin materials taught by Gash. As to Ikenaga et al., applicant refers to comparative examples 4-12 as a teaching of oriented layers possessing an average LEC exceeding $5x10^{-5}$ (/°C). However, the oriented layers in comparative examples 4-12 of Ikenaga et al. all posses an average LEC lower than $5x10^{-5}$ (/°C). This is clearly shown in Table 2 under the column "Neg lin exp coef layer". In fact, it is the unoriented layers that possess an average LEC exceeding $5x10^{-5}$ (/°C). This is shown in Table 2 under the column "Pos lin exp coef layer". Furthermore, it is noted every oriented layer in examples 1-18 taught by Ikenaga et al. possess an average LEC not exceeding $5x10^{-5}$ (/°C) (as shown in Tables 1 and 2) such that Ikenaga et al. is further evidence of the oriented layers taught by Gash inherently having the claimed LEC values.

> Applicant further argues, "In fact, because the preferred temperature range disclosed in Gash is between 60 - 180 °C, Gash does not employ the high orientation ratios required to achieve oriented materials having average coefficients of linear expansion of less than $5x10^{-5}$ (/°C) in the 20-80 °C because temperatures above that of 120 °C are employed. As recited in the present invention, "the use of orientation temperatures exceeding 120 °C may result not only in the occurrence of sheet breakage, but also in the difficulty to effect orientation at high ratios." *(page 13)*. Gash's use of temperatures exceeding 120 °C, therefore, requires that high orientation ratios are not used, and oriented materials having average coefficients of linear expansion of less than $5x10^{-5}$ (/°C) in the 20-80 °C are therefore not attained. Claim 25 has been added to

further clarify this point, requiring the orientation temperature be maintained within a range of 85 - 120 °C."

It is noted this argument is not commensurate in scope with Claim 13. Additionally, Gash does not teach orienting the polyolefin sheets over a temperature of 60-180 °C. Gash teaches bonding previously oriented polyolefin sheets at temperatures of 80 to 120 °C to form a low peel strength composite, and Gash teaches the temperatures used do not affect the orientation of the films (Column 2, lines 31-34). Gash is silent as to the temperature used to orient the polyolefin sheets. However, this deficiency is addressed above in the rejection of claim 25 in the reference to Bruno. Bruno discloses polyolefin films are oriented over a temperature range of 95-115°C, and Bruno further teaches that the amount of orientation and temperature at which the orientation is carried out are interrelated such that determining the orientation temperature for the polyolefin sheets taught by Gash as modified by the admitted prior art and Bruno is obvious.

Group 2: Claims 14-25

Claims 14-25

Applicant argues claims 14-25 are further distinguished by the materials recited therein, particularly within the claimed combinations. The oriented polyolefin materials employed in Gash, particularly oriented high-density polyethylene, are the same as those claimed by applicant, and they are consistent and in agreement with applicants specification including applicants preferred materials (Page 9, lines 7-11) such that it appears these limitations are inherent to the oriented polyolefin materials taught by Gash such that the claimed limitations are met.

Group 3: Claim 26

Claim 26

> Applicant argues, "In contrast, Gash requires that "the orientation in the films making up the laminate is not affected." *(col. 2, lines 31-34.)*. In fact, in each of the illustrative examples described in Gash, the Specification clearly stated that "[n]o pre-treatment whatsoever was given to the surfaces prior to the lamination process." (col. 3, lines 24-25; col. 4, lines 10-12; 15-37,). Gash clearly fails to teach, disclose or suggest these limitations."

It is noted Gash refers to pre-treatment as treating the surfaces to enhance adhesion through mechanisms such as electrical discharge or corona discharge (Column 1, lines 51-68 and Column 2, lines 1-3). Barham et al. are not concerned with heat treating the surfaces of an oriented polyolefin to enhance adhesion, rather Barham et al. disclose that after a polyolefin film is oriented the film has undesirable high shrinkage at elevated temperatures. Barham et al. then disclose a heat-treating process (such as contacting with a heated roller) for improving the dimensional stability of the oriented polyolefin film. Thus, the heat-treating process taught by Barham et al. is not a pre-treatment process excluded by Gash, and further it would have been obvious to incorporate the heat-treating process taught by Barham et al. in Gash to improve the dimensional stability of the oriented polyolefin sheets.

In conclusion, because Gash suggested the same polymer layers which were oriented, one would have understood that these plastic layers would have intrinsically had the same linear expansion coefficient as claimed (as further evidenced by the admitted prior art and Ikenaga et al. as discussed above). The prior art suggested that the materials employed by Gash inherently had the properties defined in the claims.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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April 27, 2004

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